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INTRODUCTION

This lesson will introduce you to the regulations and requirements of the CG Ballast Water Management Program and for conducting Ballast Water Management inspection.

Materials needed for this training session include:

- **33 CFR 151**
 - **NVIC 8-99:** “Guidance for the Enforcement of the 1999 Amendments to Title 33 Code of Federal Regulation Part 151, Implementation of the National Invasive Species Act”
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LESSON OBJECTIVES This block of instruction is designed to give you the following knowledge:

UNDERSTAND the aquatic nuisance species issues and the need for Ballast Water Management.

IDENTIFY the key provisions of the Ballast Water Management regulations for both voluntary guidelines and mandatory requirements.

UNDERSTAND the purpose of the ballast water inspections and how to collect and report ballast water management data during an inspection.

LESSON ONE

AQUATIC NUISANCE SPECIES AND BALLAST WATER

Section 1-1 ANS AND THEIR IMPACTS

The term non-indigenous species (NIS) refers to any non-native organism that, through man's activity, has spread beyond its natural, historical geographic range. Once in a new environment, NIS often become ecologically dominant because the physical and biological factors that kept them in check in their native ecosystems are absent. NIS are also referred to as exotic, alien, introduced, or non-native species.

While the Coast Guard is concerned with aquatic nuisance species, those NIS whose introductions have resulted in negative economic or ecological impacts to aquatic ecosystems, it is important to realize that not all NIS are harmful. Many of our nationally produced crops are not native to the U.S. For example, corn, wheat and other grains, and numerous fruit trees are all introduced species we cultivate for profit. Similarly, a number of introduced marine species form the basis for an important aquaculture industry. Perhaps the best example of an aquaculture introduction is the Japanese oyster on the Pacific Coast of North America.

Aquatic nuisance species (ANS) are those organisms whose introductions into waters of the U.S. have adversely impacted their new habitats. They have become one of the greatest threats to our marine environment. Unlike other forms of pollution, once an ANS establishes itself in a new environment it is here to stay. One of the primary culprits for the introduction and spread of ANS is ballast water from ships.

Attention to ANS grew during the early 1990's when zebra mussels (*Dreissena polymorpha*) were identified in the Great Lakes. Introduced from the Eastern Europe, this nonindigenous species was found to have most likely entered the waterway by ship's ballast water. Once established in the Great Lakes, the zebra mussel was able to out-compete native mussels for food and substrate, as well as causing millions of dollars of damage to the water intake pipes of power plants and municipal water supplies by encrusting in and around the pipes. It is an expensive and time-consuming process to remove or prevent the establishment of these newcomers.

Other examples of ANS are the ruffe (pronounced "rough") and Hydrilla. The ruffe (*Gymnocephalus cernuus*) is a fish believed to have been introduced through ballast water at Duluth Harbor in Lake Superior. Originally from Eurasia, this bottom feeding fish competes with native fish for food and habitat. It has quick growth and reproductive rates, as well as sharp spines on its gill coverings and dorsal and anal fins to protect it from

possible native predators such as the walleye and pike.

Hydrilla (*Hydrilla verticillata*) is an ornamental plant introduced to the US in the 1950s for aquarium use. It was discarded or planted in the canals of Florida and quickly spread throughout the inland water system. Once introduced, Hydrilla invades deeper waters of a system and aggressively and competitively spreads to the shallower waters, forming thick mats that shade the native plants below the water's surface. In addition to displacing beneficial plants, Hydrilla can also result in fish kills when the decomposition of the large accumulation of plant biomass reduces the availability of dissolved oxygen. Transported from one body of water to another by fragments attached to recreational boats, their motors, trailers, and live wells, Hydrilla is highly adaptive and resilient. When Hydrilla has established itself in a water body, it can restrict water flow and block the withdrawal of water used for power generation and agricultural irrigation.

The impacts of ANS are not limited to money and time spent scraping zebra mussels out of pipes. There are three general categories of impacts caused by the introduction of an ANS to a new environment: 1) ecological, 2) economic, and 3) public health. Many ANS are opportunists, meaning they are capable of taking advantage of a new environment quickly because of a rapid growth rate, quick reproductive rate, and the ability to tolerate a variety of environmental conditions. As a result, ANS are often able to out-compete the native species for food and habitat, and in some cases, alter the environment. For example, the infamous zebra mussels are such efficient filter feeders that they alter the food web in their new environment, making it impossible for native mussels, plants, and fish to survive.

Associated with the environmental impacts are the economic impacts. Alterations to the environment that adversely affect other organisms can be detrimental to the biological resources such as crops or fisheries, while damage to structures can be expensive to repair and maintain. The public health impact also has the potential to be significant. While the microbial content of ballast water can often be attributed to poor drinking water and wastewater systems of developing countries, coastal waters of industrial countries are not free from human pathogens. When taken on board as ballast, the microbial infested water is transported to other areas. This discharge may infect local fish and shellfish populations, which may later be harvested for human consumption.

While zebra mussels are believed to have been introduced by ballast water, not all ANS claim marine transportation as a vector. Numerous plants have been imported into the U.S. for the aquarium industry, only to be dumped into lakes, streams, and canals. Fish and invertebrate species

were introduced into U.S. waters by anglers as bait or to serve as a food source for sport fish. Despite the variety of pathways for the introduction of ANS, possibly the most significant is ballast water.

Section 1-2

WHAT IS BALLAST AND WHY IS IT IMPORTANT?

Ballast water is considered any water and suspended matter taken on board a vessel to control or maintain trim, draught, stability, or stresses on the vessel, regardless of how it is carried.

A vessel not in ballast would not be able to maintain its trim and stability. Steerage would be difficult if not impossible. The vessel would be under tremendous stress and could possibly flip over or crack into pieces.

During the 20th century, water became the primary form of ballast on board ships, with vessels filling their ballast tanks with thousands of tons of fresh, brackish, and open-ocean water. It also became a significant pathway for the transfer of organisms. While shipping has always been an important mechanism for the human mediated transfer of organisms around the globe, the explosive growth of international marine transportation since World War II has caused a similar increase in the rate of new introductions of NIS.

Vessels typically take on ballast water at their last port of call and discharge the ballast upon arrival in a new port. In some instances, this water has traveled half way around the world. Organisms hitchhiking their way to a new environment find themselves released into an ecosystem with few, if any, natural predators.

Here lies the challenge of ballast water management: How do we stop the introduction and spread of nonindigenous species while maintaining vessel safety and allowing for the free flow of waterborne commerce?

SECTION 1-3

SELF TEST FOR LESSON ONE:

1. What are non-indigenous species?
2. Give an example of a beneficial non-indigenous species.
3. Give an example of aquatic nuisance species.
4. What are the three general types of impacts of ANS?
5. Give an example of each of the three types from question # 4.
6. What is the function of ballast water on board a ship?

LESSON TWO

BALLAST WATER LEGISLATION AND GUIDELINES

Section 2-1 THE REGULATIONS

The ecological and economic impacts resulting from the introduction of zebra mussels into the Great Lakes generated public and industry pressure for legislative assistance. In response, Congress passed the **Non-indigenous Aquatic Nuisance Prevention and Control Act** (NANPCA) of 1990. This act created a regional ballast water management program for the Great Lakes and initiated studies to document the need for a national program.

Specifically, NANPCA directed the Coast Guard to issue regulations and guidelines to control the introduction and spread of ANS in the Great Lakes ecosystem (includes the Great Lakes and the area of the Hudson River north of the George Washington Bridge). It also required an assessment of ballast water management (BWM) practices in all U.S. ports and the development of mariner education and assistance programs. By 1991, the USCG developed voluntary guidelines for the Great Lakes which advised ships entering these waters from outside the Exclusive Economic Zone (EEZ) to have either conducted mid-ocean ballast water exchange (BWE) or an acceptable alternative. These guidelines became mandatory in 1993.

The continued introduction and spread of ANS prompted Congress to pass the **National Invasive Species Act** (NISA) in 1996. NISA mandated the creation of a national ballast water management program, including the continuation of the Great Lakes mandatory program. The USCG was charged with establishing a voluntary BWM program for all other U.S. ports¹.

In July 1999, the new BWM program became effective. The BWM program contains both voluntary guidelines and mandatory requirements to help reduce the introduction and spread of ANS into a marine environment by both foreign and U.S. vessels. The regulations “Ballast Water Management for Control of Non-indigenous Species in the Great Lakes and Hudson River” and “Ballast Water Management for Control of Non-indigenous Species in Waters of the United States” are contained in 33 CFR Part 151, Subparts C and D, respectively. Subpart C details the

¹ “All other U.S. ports” does not include export crude oil tankers visiting Alaskan ports. A 1996 Presidential Document memorandum, “Exports of Alaskan North Slope Crude Oil,” required the owner or operator of an Alaskan North Slope crude oil export tanker to adopt a mandatory program of deep water ballast exchange. Applies only to foreign export of oil, not domestic.

mandatory program for the Great Lakes ecosystem, while Subpart D outlines the voluntary guidelines, including the mandatory BWM reporting requirement, for all other waters of the U.S. NVIC 8-99 includes these regulations, as well as amplifying information on conducting ballast water exams.

Currently there are few penalty provisions, outside of the Great Lakes, provided by these regulations. The incentive for industry to comply is the threat that if they do not, a report on the lack of voluntary compliance will be delivered to Congress by January 2002 resulting in the Act being amended to provide for penalty provisions and to turn the voluntary guidelines into mandatory requirements.

Section 2-2 VOLUNTARY GUIDELINES

The voluntary guidelines are designed to encourage precautionary practices that should be taken by every vessel to minimize the uptake and release of harmful aquatic organisms, pathogens or sediments. The three main components of the CG's voluntary BWM program are:

- (1) To promote BWM by operators of all vessels in waters of the U.S.
- (2) To provide voluntary BWM guidelines for all vessels entering the U.S. waters from outside the EEZ.
- (3) To request the reporting of BWM practices by all vessels entering U.S. waters from outside the EEZ.

Voluntary guidelines apply to:

- (1) All vessels, U.S. and foreign, equipped with ballast tanks that operate in the waters of the U.S.
- (2) All vessels, U.S. and foreign carrying ballast water, including residuals, into the waters of the US after operating beyond the Exclusive Economic Zone (200 nautical miles offshore).

The Voluntary Guidelines:

The CG established the following guidelines in order to minimize the uptake and release of ANS by ALL vessels with ballast tanks operating in U.S. waters:

- Avoid ballast operations in or near marine sanctuaries, preserves, parks, or coral reefs.

- Avoid taking on ballast water:
 - in areas known to contain harmful organisms and pathogens, such as toxic algal blooms;
 - near sewage outfalls;
 - near dredging operations;
 - where tidal flushing is poor or when a tidal stream is known to be more turbid;
 - in darkness when organisms may rise up in the water column; or
 - in shallow water or where propellers may stir up the sediment.
- Clean ballast tanks regularly
- Discharge minimal amounts of ballast water in coastal and internal waters.
- Rinse anchors and anchor chains during retrieval to remove organisms and sediments at their place of origin.
- Remove fouling organisms from hull, piping, and tanks on a regular basis and dispose of any removed substances in accordance with local, State and Federal regulations.
- Maintain a vessel specific BWM plan.
- Train vessel personnel in ballast water and sediment management and treatment procedures.

There are additional voluntary BWM practices for vessels operating beyond the EEZ. These vessels are asked to do one of the following:

- (1) Exchange ballast water more than 200 miles from any shore, and in waters more than 2,000 meters deep.
- (2) Retain the ballast water on board.
- (3) Discharge the ballast water to an approved reception facility.
- (4) Under extraordinary conditions, conduct a ballast water exchange within an area agreed to by the COTP at the time of the request.
- (5) Use an alternative environmentally sound method of ballast water management that has been approved by the CG.

While the only ballast water treatment currently approved by the Coast Guard is mid-ocean ballast water exchange, it is the policy of the U.S. that ballast water management practices will not jeopardize the safety of a vessel, its crew, or its passengers. A ship's master has the final say in whether or not a mid-ocean exchange is possible given the operational conditions facing the vessel. For ships calling in the Great Lakes ecosystem, a more sheltered alternative exchange zone is provided for those ships that cannot conduct a mid-ocean exchange prior to arrival.

There is also a safety exemption that gives a ship's captain absolute discretion for determining if performing open-ocean exchange would threaten the safety of the crew or the vessel.

Section 2-3

SELF TEST FOR LESSON TWO

1. What legislation gave the Coast Guard the authority to regulate ballast water and ANS in the Great Lakes in 1990?
2. What is the reference for "Ballast Water Management for Control of Non-indigenous Species in the Great Lakes and Hudson River?"
3. What are the three main components of the Coast Guard's BWM program?
4. To which vessels do the voluntary guidelines apply?
5. What are three of the recommended BWM practices in the Coast Guard's BWM program?
6. Regardless of location of first port of call, what is the one reason a ship master, operator, or owner can cite for not having conducted some form of ballast water management?

LESSON THREE

THE MANDATORY REPORTING REQUIREMENT

Section 3-1 MANDATORY REPORTING REQUIREMENTS

Mandatory reporting requirements apply to:

- All vessels, U.S. and foreign, equipped with ballast tanks entering the waters of the US after operating beyond the EEZ. However, there are some exemptions:

Exemptions include: DOD and CG vessels, passenger vessels equipped with a functioning treatment system designed to kill organisms in the ballast water, crude oil tankers engaged in the coastwise trade, vessels that will discharge their ballast at the same location where the ballast was taken on. (See **33 CFR 151.2010** through **33 CFR 151.2030** for in-depth information.)

The Mandatory Reporting Requirements (33 CFR 151.2040):

The mandatory reporting requirements involve notification and record keeping. It is important to note that while the ballast water management guidelines are voluntary (except in the Great Lakes ecosystem), the reporting of ballast water management data is expected of **all** ships. This includes ships which declare NOBOB (no ballast on board) and ships not exchanging their ballast. **ALL VESSELS, FOREIGN AND U.S. FLAG, EQUIPPED WITH BALLAST WATER TANKS AND ENTERING THE WATERS OF THE U.S. AFTER OPERATING OUTSIDE THE EEZ MUST SUBMIT A BWM REPORT.**

NISA established a ballast water reporting requirement and directed the Coast Guard and the Smithsonian Environmental Research Center (SERC) to create and operate the National Ballast Information Clearinghouse (NBIC). The NBIC is responsible for the collection and analysis of information regarding compliance with ballast water reporting requirements, ballast water management practices, and surveys of ANS in waters of the U.S.

Ballast water data is collected through the National Ballast Survey (NABS). The goal of NABS is to gather data on ballast water management from **all** vessels entering U.S. ports from outside the EEZ. The survey collects information such as where ballast water was collected, whether or

not ballast water was exchanged in mid-ocean, and where/how much foreign-acquired ballast is to be discharged within the U.S. NABS has two sources of data.

1) Ballast Water Management Reporting Form: This form was designed by the Coast Guard and SERC and tested in a pilot project before being implemented. It requests basic information on ballast water and the vessels management practices (see NVIC 8-99 or 31 CFR 151 Subpart D). This form can be submitted to the NBIC via mail, fax, or the Internet.

2) U.S. Maritime Administration (MARAD) data: MARAD collects data on all vessels arriving into U.S. ports. The total number of arrivals recorded by MARAD is compared to the number of BWM forms collected by the NBIC in order to determine the rate of compliance.

The U.S. is not the only country working to prevent and control the spread of ANS. The International Maritime Organization (an agency of the United Nations) recognizes the critical role the maritime industry plays in the spread of ANS. Its Marine Environmental Protection Committee (MEPC) is addressing this issue on a global level. The Coast Guard leads the U.S. participation in the MEPC, where efforts are underway to develop a global treaty on ballast water management.

Masters, owners, operators or persons in charge of a vessel to which the reporting requirement applies must provide the information required on the BWM reporting form, found in 33 CFR 151.2045, in electronic or written form to the Commandant, USCG prior to entering the first US Port of Call. However, vessels bound for the Hudson River must report directly to COTP NY, and those bound for the Great Lakes report directly to COTP Buffalo, MSD Massena. All reporters are encouraged to use the “Ballast Water Reporting Form” template provided by the USCG.

An example of the Ballast Water Reporting Form can be found in Appendix B. The master, owner, operator, or person in charge of the vessel must retain a signed copy of this information onboard the vessel for 2 years. The following information is collected on the reporting form:

- 1) Vessel information – name, IMO (International Maritime Organization) number or other official number if IMO number not issued, vessel type, owner or operator, gross tonnage, call sign, and port of registry (flag).
- 2) Voyage information – date and port of arrival, vessel agent, last port and country of call, and next port and country of call.
- 3) Total ballast water information – total ballast water capacity, total volume of ballast on board, total number of ballast water tanks, and total number of ballast water tanks containing ballast. [units of measurement: metric tons (MT), cubic meters (m³), long tons (LT), and short tons (ST)]

- 4) Ballast water management – total number of ballast tanks/holds to be discharged into waters of the US or to a reception facility. If an alternative BWM method is used, the number of tanks that were managed using the alternative method, as well as the type of method, whether the vessel has a ballast water management plan and IMO guidelines on board, and whether the BWM plan was used.
 - 5) Information on ballast water tanks that are to be discharged into the waters of the US or to a reception facility –
 - a) Origin of the ballast water – date(s), location(s), volume(s), and temperature(s). (If a tank is to be exchanged, list the loading port of the ballast water that is discharged during the exchange.)
 - b) Exchange or other management plans – date(s), location(s), volume(s), method, thoroughness (percent exchanged if BWE conducted), and sea height at time of exchange (if BWE conducted).
 - c) Discharge – expected date, location, volume, and salinity of any ballast water to be discharged into waters of the US or a reception facility.
 - d) Sediments – If sediments are to be discharged within the jurisdiction of the US, include the location of the disposal facility.
 - e) Certification of accurate information – master, owner, operator, person in charge, or responsible officer's printed name, title, and signature attesting to the accuracy of the information provided and certifying compliance with the requirements of the regulations.
 - f) Change to previously submitted form – indicates if information is a change to a previously submitted Ballast Water Reporting Form
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Section 3-2

SELF TEST FOR LESSON THREE

1. What vessels are required to report their ballast water management practices? What vessels are exempt?
2. What is the regulatory source for the reporting requirement?
3. What organization helps collect and analyze ballast water information for the Coast Guard?
4. What are the two sources of data for NABS?
5. What information is collected on the Voyage Information portion of the BW reporting form?

LESSON FOUR

THE ROLE OF THE COAST GUARD

Section 4-1 CG BOARDINGS

All COTP zones outside of the Great Lakes, including San Juan and Guam, will participate in a ballast water education and enforcement program as part of the Port State and Flag State inspection programs. Personnel that perform these inspections should have completed the Ballast Water Inspection Qualification (included in the NVIC).

Field efforts should emphasize the monitoring of compliance with the BWM regulations (reporting requirements) during Port State and Flag State Inspections. This includes the examination of documents and reports, sampling of ballast water and sediments, and making other appropriate inquiries to assess compliance with ballast water regulations and guidelines during the course of the inspection.

Recommended methods for incorporating BWM enforcement into boardings include:

1. Verifying that the ship's ballast water report was submitted to the National Ballast Information Clearinghouse;
2. Comparing the deck log, ballast water report, and charts to verify that exchange, if conducted, was performed in areas further than 200 miles from any shore and in waters greater than 2000 meters in depth;
3. Spot checking ballast tanks for salinity levels and to verify their understanding of what is required;
4. If the vessel claims that it was unsafe to conduct an exchange, identify what the circumstances were using log books, weather charts, stability and loading book, and vessel particulars;
5. Interviewing the officer responsible for completing the form to verify their understanding on what is required;
6. If an alternative treatment was used, verify that it is utilized in an approved manner;
7. Ensuring appropriate MISLE entries are made that indicate if a BW exam was conducted.

Other items to call to the attention of the master, operator, or agent during the inspections are:

- Emphasizing that ballast water reports are required each time the vessel enters US waters from outside the EEZ.
- Distributing the brochures and discs that have been provided; and
- Informing all vessels that they are required to report even if they are declaring "no ballast on board" or have no intentions of discharging ballast water in the US.

Section 4-2

BALLAST WATER

SAMPLING PROCEDURES

Additionally, the inspection teams will take samples and test the ballast water to check if an adequate exchange has taken place. This is done using a handheld salinity meter. A salinity reading of more than 30 parts per thousand indicates that an adequate exchange took place (Open ocean water will be saltier than harbor water which usually has fresh water mixed in it as well).

The primary means for sampling ballast water tanks on vessels is through use of a bailer. The bailer being supplied to all units consists of a 1.05" X 5" white PVC regular bailer with a stainless steel check/ball and tethered by a 100 foot reel tape. The bailer is manufactured by TIMCO MFG, INC located in Prairie Du Sac, WI (800-236-8534). Contact the manufacturer for replacement bailers. As an alternative, units may develop and/or purchase various other sampling and testing equipment to fulfill the requirements for taking salinity measurements. Electronic devices such as the YSI Model 30 Salinity Meter with a 50 foot cable has been proven to be effective by other units. This can be ordered through the Forestry Suppliers catalog (800-752-8460), or other environmental equipment supply company. Refractometers may also be ordered through Forestry Suppliers.

Ballast water will be sampled and tested for salinity when the following occurs: ballast water is being discharged into U.S. waters or records show that ballast water has been exchanged on the voyage, whether the vessel is discharging ballast water or not.

Salinity in at least 10% of the vessel's tanks (a minimum of 2 tanks must be sampled) will be tested to confirm that a ballast water exchange has taken place. Ballast water is typically found in wing tanks, double bottoms, peak tanks, and cargo holds. Access to these tanks is normally gained through vents, manholes, hatches and sounding tubes.

In some instances, stratification of the water column in the ballast tanks may occur. Lower salinity (less dense) water may layer at the surface of the tanks or may completely fill the sounding tube. This may be particularly true if the cap of the tube was in place and airtight, creating a vacuum. If a vessel claims to have conducted an exchange and readings indicate otherwise, further samples from areas deeper in the tanks or from access points other than the sounding tubes such as a vent or hatch may be required.

Extreme caution should be used in sampling and handling ballast water. Since ships usually take on ballast water while in port or close to shore, organisms, matter, and microorganisms present in the water can be introduced into the ballast tanks of ships. Studies have shown that ships carrying ballast water had fecal coliforms and *E. coli*, and some vessels have tested positive for enterococci. The potential presence of fecal matter and other harmful organisms in ballast water makes it necessary for inspection personnel to be aware of the hazards and potential risks associated with ballast water sampling. These risks can be minimized greatly by using personal protective equipment (PPE) and following basic hygiene and work practices as outlined in the Ballast Water NVIC.

SECTION 4-3 COMPUTER ENTRY

Ensure that appropriate documentation of Ballast Water Activities is entered into the computer system. This includes any activity related to ballast water management.

Enter the following information into MISLE:

In the Activity Report:

- 1) enter Vessel Inspection under Activity Type.
- 2) enter Ballast Water Examination under Sub-Activity Type.
- 3) in the comment block insert appropriate comments, such as:
 - a) conducted Ballast Water Activity in conjunction with other activity.
 - b) verified VSL has submitted ship's Ballast Water Reporting Form to NBIC.

Note: BWE conducted for the Great Lakes differ from the National Program and boarding officers should follow local instructions.

Section 4-4 SAFETY AND HEALTH ISSUES

Prudent care should be given while collecting and testing ballast water samples including wearing coveralls or tyvek suits, medical grade gloves, and face/eye protection. Outer garment should be stored in a plastic bag until it can be properly cleaned or disposed of. The NVIC instructs that members should not eat during or immediately following an inspection until the boarding party members have a chance to remove any residue by washing hands and face with an antibacterial soap.

If ballast water does come into contact with skin; especially the eyes, nose or mouth; the area should be flushed with clean water.

Section 4-5

SELF TEST FOR LESSION FOUR

1. What general field efforts should be made to verify compliance to the mandatory reporting requirements during Port State and Flag State boardings?
2. What salinity reading indicates an open ocean exchange of ballast water has occurred?
3. How many tanks must be sampled?
4. What causes stratification in the ballast tanks and what should be done in the event this occurs?
5. What three pieces of safety equipment should be worn when conducting a ballast water exchange and why?

LESSON FIVE

RECREATIONAL ACTIVITIES GUIDELINES

Section 5-1

VOLUNTARY GUIDELINES

Another requirement of NISA was direction to the ANSTF to develop guidelines for recreational activities to prevent and control the spread of zebra mussels and other ANS and for the Coast Guard to promulgate these guidelines. Recreational activities may account for much of the spread of ANS in the domestic waters of the United States. For example, the introduction of zebra mussels is most commonly attributed to ballast water. However, once introduced into the Great Lakes systems, zebra mussels quickly spread through the water bodies of the Great Lakes region by hitchhiking on boats, trailers, SCUBA equipment, personal watercraft, and seaplanes. The Recreational Activities Committee of the ANSTF developed guidelines detailing how the public can assist in reducing the movement of ANS. Once drafted, the Coast Guard was responsible for publishing the notice and collecting the comments during the review period. The final product, Voluntary Guidelines on Recreational Activities to Control the Spread of Zebra Mussels and Other Aquatic Nuisance Species, was published in the Federal Register on 28 December 2000 (Vol 65, No 250). See Appendix D to read the guidelines or view them on-line at <http://152.119.239.10/docimages/p56/119638.pdf>

Section 5-2

EDUCATION AND OUTREACH

The recreational activities guidelines (RAG) are an important part of the Coast Guard's ANS education and outreach campaign. These guidelines are meant for the general public and recommend simple steps they can take to help protect aquatic ecosystems from the threat of ANS. For example, the guidelines suggest boats and boat trailers be physically examined for animals and plant materials that could be clinging to the surface or caught in the various intake and exhaust pipes. All parts of a boat should be dried for at least 5 days before placing the boat into another body of water, or the boat can be cleaned with hot water or high-pressured water to remove any organisms.

For anglers and waterfowl hunters, the RAG recommends inspecting equipment for "hitchhiking" organisms, never releasing live bait into a body of water, and properly caring for boats and trailers as described above. Seaplane pilots are advised to inspect aircraft for plant and animal

material, pump the floats to remove infested water, thoroughly clean their aircraft if it is moored in infested waters, raise and lower water rudders several times during takeoff to free fragments of aquatic plants, as well as other recommendations for takeoff, landings, and storage of planes. Personal watercraft should be treated like boats and trailers with regards to visual inspection and cleaning of the craft. In addition, the engine should be run for 5 to 10 seconds after removing the watercraft from the water in order to blow out any excess water and vegetation.

It is important that the public be made aware of these guidelines and encouraged to incorporate these actions into their normal routines. To many people it may seem unlikely that actions such as running watercraft engines to flush out retained organisms would be of much use in preventing introductions of ANS. However, very little is known about how many individual organisms need to be introduced to a new habitat in order to establish a new population. Several careful studies have indicated that it may take only a few individuals to establish a population capable of overwhelming the ecosystem. The recommendations in the RAG were developed to be easy to perform, yet, if followed properly, provide a high degree of control against a variety of ANS. The next step for the Coast Guard is to inform the public of these guidelines and promote a behavioral change that will benefit the aquatic environment by controlling the spread of ANS.

The Coast Guard Auxiliary plays a vital role in this outreach campaign. Through its boating safety courses, vessel safety checks, boat show exhibits, and advisory circulars, the Auxiliary reaches millions of members of the general water recreation public. With its understanding of aquatic nuisance species and the roles ballast water and recreational activities play in the introduction and spread of ANS the Auxiliary acts as a vital element in national efforts to control these organisms and preserve our aquatic environments.

As a member of the ANS Task Force's Communication, Education, and Outreach Committee, the Coast Guard is working with a variety of federal and state and non-governmental organizations to develop an outreach campaign to educate the water recreation public about the simple measures they can take to control the spread of ANS. For more information on ANS in your area, try contacting your county's extension office, your state's department of natural resources, or a local or regional Sea Grant office.

Section 5-3

SELF TEST FOR LESSON 5

1. Who developed the Recreational Activities Guidelines?
2. What are three recommendations made by the RAG for all aquatic recreational equipment?
3. What does the RAG recommend anglers do with live bait?
4. What does the RAG recommend personal watercraft owners should do for 5-10 seconds after removing the craft from the water?
5. Seaplane pilots should raise and lower the _____ to free fragments of aquatic plants.
6. What recreational activities are discussed in the RAG?
7. Site three other agencies that could provide information on ANS?

APPENDIX A

ANSWERS TO THE SELF TEST QUESTIONS

Section 1-3

1. Non-indigenous species (NIS) are non-native organisms that, through human activity, have spread beyond their natural, historical geographic range.
2. Examples of beneficial NIS are corn, wheat and other grains, fruit trees, Japanese oysters
3. Examples of ANS are zebra mussels, Hydrilla, ruffe, cholera
4. The three types of ANS impacts are ecological, economic, and public health
5. a) Ecological impacts – zebra mussels out-competing native mussels for food and substrate, Hydrilla mats shading native plants and resulting in fish kills, ruffe out-competing native fish and not being susceptible to native predators
b) Economic impacts – expense to clean pipes and outfalls clogged by zebra mussels and Hydrilla, reduction in biological resources, damage to structures
c) Public health impacts – human pathogens carried in ballast water
6. Source of weight to manipulate the center of balance on a ship, used to aid stability, structural integrity, propulsion, and maneuverability.

Section 2-3

1. Non-indigenous Aquatic Nuisance Prevention and Control Act of 1990 (NANPCA)
2. 33 CFR Part 151, Subpart C
3. (1) To promote BWM for operators of all vessels in waters of the U.S.
(2) To provide voluntary BWM guidelines for all vessels entering the U.S. waters from outside the EEZ.
(3) To require the reporting of BWM data by all vessels entering U.S. waters from outside the EEZ.
4. Voluntary guidelines apply to:
 - All vessels, U.S. and foreign, equipped with ballast tanks that operate in the waters of the U.S.
 - All vessels, U.S. and foreign carrying ballast water, including residuals, into the waters of the US after operating beyond the Exclusive Economic Zone (200 nautical miles offshore).
4. -Avoid ballast operations in or near marine sanctuaries, marine preserves, marine parks, or coral reefs.
-Avoid taking on ballast water:
 - with harmful organisms and pathogens, such as toxic algal blooms
 - near sewage outfalls.
 - near dredging operations.
 - where tidal flushing is poor or when a tidal stream is known to be more turbid.
 - in darkness when organisms may rise up in the water column.
 - in shallow water or where propellers may stir up the sediment.
- Clean ballast tanks regularly
- Discharge minimal amounts of ballast water in coastal and internal waters.
- Rinse anchors and anchor chains during retrieval to remove organisms and sediments at their place of origin.
- Remove fouling organisms from hull, piping, and tanks on a regular basis and dispose of any removed substances in accordance with local, State and Federal regulations.
- Maintain a vessel specific BWM plan.
- Train vessel personnel in ballast water and sediment management and treatment procedures.
5. If BWE would have jeopardized the safety of a vessel, its crew, or its passengers.

Section 3-2

1. All vessels, U.S. and foreign, equipped with ballast tanks entering the waters of the US after operating beyond the EEZ. Exemptions include: DOD and CG vessels, passenger vessels equipped with a functioning treatment system designed to kill organisms in the ballast water, crude oil tankers engaged in the coastwise trade, vessels that will discharge their ballast at the same location where the ballast was taken on.
2. 33 CFR 151.2040
3. NBIC
4. MARAD and BW reporting form
5. Information includes the date and port of arrival, vessel agent, last port and country of call, and next port and country of call.

Section 4-5

1. Field efforts include: examination of documents and reports, sampling of ballast water and sediments, and making other appropriate inquiries to assess compliance with ballast water regulations and guidelines during the course of the inspection.
2. A salinity of 30 ppt indicates open ocean exchange has occurred.
3. Sample 10% of ballasted tanks or at least 2 tanks.
4. Stratification may be caused by lower salinity (less dense) water forming a layer at the surface of the tanks or completely filling the sounding tube. This may be particularly true if the cap of the tube was in place and airtight, creating a vacuum. If a vessel claims to have conducted an exchange and readings indicate otherwise, further samples from areas deeper in the tanks or from access points other than the sounding tubes such as a vent or hatch may be required.
5. Proper safety equipment includes: coveralls or tyvek suits, medical grade gloves, and face/eye protection.

Section 5-3

1. Recreational Activities Committee of the ANS Task Force
2. Physically examine equipment for animals and plant materials that could be clinging to the surface or caught in the various intake and exhaust pipes, dry equipment for at least 5 days before placing the boat into another body of water or the equipment can be cleaned with hot water or high pressured water to remove any organisms.
3. Never release live bait into a body of water, dump bait onto land far from water's edge.
4. Run engine to blow out excess water and vegetation
5. Rudders
6. SCUBA diving, water fowl hunting, recreational harvest of live bait, angling, recreational boating, personal watercraft, seaplanes
7. Contact county extension offices, state departments of natural resources, NOAA Sea Grant offices and the USCG Office of Environmental Standards.

Appendix B

BALLAST WATER REPORTING FORM

IS THIS AN AMENDED BALLAST REPORTING FORM? YES NO

1. VESSEL INFORMATION

Vessel Name:
IMO Number:
Owner:
Type:
GT:
Call Sign:
Flag:

2. VOYAGE INFORMATION

Arrival Port:
Arrival Date:
Agent:
Last Port: Country of Last Port:
Next Port: Country of Next Port:

3. BALLAST WATER USAGE AND CAPACITY

Specify Units Below (m³, MT, LT, ST)
Total Ballast Water on Board:
Volume Units No. of Tanks in Ballast
Total Ballast Water Capacity:
Volume Units Total No. of Tanks on Ship

4. BALLAST WATER MANAGEMENT

Total No. Ballast Water Tanks to be discharged:

Of tanks to be discharged, how many: Underwent Exchange: Underwent Alternative Management:

Please specify alternative method(s) used, if any:

If no ballast treatment conducted, state reason why not:

Ballast management plan on board? YES NO Management plan implemented? YES NO

IMO ballast water guidelines on board [res. A.868(20)]? YES NO

5. BALLAST WATER HISTORY: Record all tanks to be deballasted in port state of arrival;

IF NONE, GO TO #6 (Use additional sheets as needed)

Tanks/ Holds <small>List multiple sources/tanks separately</small>	BW SOURCES				BW MANAGEMENT PRACTICES						BW DISCHARGES			
	DATE DD/MM/Y Y	PORT or LAT. LONG.	VOLUME (units)	TEMP (units)	DATE DD/MM/Y Y	ENDPOINT LAT. LONG.	VOLUME (units)	% Exch	METHOD (ER/FT/ ALT)	SEA HT. (m)	DATE DD/MM/Y Y	PORT or LAT. LONG.	VOLUME (units)	SALINIT Y (units)

Ballast Water Tank Codes: Forepeak = FP, Aftpeak = AP, Double Bottom = DB, Wing = WT, Topside = TS, Cargo Hold = CH, Other = O

6. RESPONSIBLE OFFICER'S NAME AND TITLE, PRINTED AND SIGNATURE:

Where to send this form.

Vessels bound for Great Lakes:

United States or Canadian Flag vessel bound for the Great Lakes

Fax the form to the COTP Buffalo, Massena Detachment 315-764-3283 at least 24 hours before the vessel arrives in Montreal, Quebec.

Any other Flag vessel bound for the Great Lakes

Fax the form to the COTP Buffalo, Massena Detachment 315-764-3283 at least 24 hours before the vessel arrives in Montreal, Quebec, or;

Complete the ballast water information section of the St. Lawrence Seaway required “Pre-entry Information from Foreign Flagged Vessels Form” and submit it in accordance with the applicable Seaway Notice.

Vessels bound for the Hudson River North Of George Washington Bridge

Vessel bound for the Hudson River north of the George Washington Bridge

Fax the form to the COTP New York at 718-354-4249 before the vessel enters the waters of the United States (12 miles from the baseline).

Vessels bound for all other United States Ports

Vessel bound for all ports within the waters of the United States other than the Great Lakes or Hudson River north of the George Washington Bridge

Before the vessel arrives at the first port of call in the waters of the United States send the form by one of the three following methods:

- **Mail the form to the U.S. Coast Guard, c/o Smithsonian Environmental Research Center (SERC), P.O. Box 28, Edgewater, MD 21037-0028;**
- **Transmit the form electronically to the National Ballast Information Clearinghouse (NBIC) at <http://invasions.si.edu/ballast.htm> or e-mail it to ballast@serc.si.edu; or**
- **Fax the form to the Commandant, U.S. Coast Guard, c/o the NBIC at 301-261-4319.**

If any information changes, send an amended form before the vessel departs the waters of the United States.

An agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The Coast Guard estimates that the average burden for this report is 35 minutes. You may submit any comments concerning the accuracy of this burden estimate or any suggestions for reducing the burden to: Commandant (G-MSO), U.S. Coast Guard, 2100 Second St. SW, Washington, DC 20593-0001, or Office of Management and Budget, Paperwork Reduction Project (2115-0598), Washington, DC 20503.